Amendment to the Claims:

1-2. (Cancelled)

3. (Previously Presented) A method for monitoring a patient comprising:

receiving a plurality of monitored signals carried on leads from the patient, each of the monitored signals providing information as to health of the patient;

employing hypothesis testing against each of the plurality of monitored signals to determine whether an artifact is present in the plurality of monitored signals, in which a null hypothesis includes an assumption that pairs of samples of correlated monitored signals of the plurality of monitored signals have a predetermined distribution, and the predetermined distribution including the same distribution as corresponding pairs of stored versions of the plurality of monitored signals;

determining that an artifact may exist in one of the plurality of monitored signals when a likelihood that the null hypothesis is true falls below a predetermined confidence level; and

in response to the likelihood falling below the predetermined confidence level, generating an alert on a user interface device.

4. (Previously Presented) The method according to claim 3, wherein the hypothesis testing includes generating a probability that each of the monitored signals includes an artifact.

5. (Previously Presented) The method according to claim 4, wherein generating the alert includes:

generating an artifact alert that at least one of the monitored signals includes an artifact on the user interface when the generated probability exceeds a predetermined threshold.

6. (Cancelled)

7. (Previously Presented) The method according to claim 9, further comprising:

calculating a correlation matrix for the plurality of monitored signals ($S_1 \ldots S_n$) from a database of a plurality of stored monitored signals as follows:

$$\begin{bmatrix} r_{11} & \cdots & r_{1n} \\ \vdots & & \vdots \\ r_{n1} & \cdots & r_{nn} \end{bmatrix}$$

wherein r11 is an autocorrelation of a first monitored signal (S_1) of the plurality of monitored signals ($S_1 \ldots S_n$) with itself ($r_{11}=1$) and r_{1n} is a cross correlation between the first monitored signal (S_1) of the plurality of monitored signals ($S_1 \ldots S_n$) and another monitored signal (S_n) of the plurality of monitored signals ($S_1 \ldots S_n$).

8. (Original) The method according to claim 7, further comprising:

identifying one or more pairs of highly correlated monitored signals among the plurality of monitored signals by determining which one or more pairs of monitored signals have a cross correlation that exceeds a predetermined threshold.

9. (Previously Presented) A method for detecting an artifact comprising:

receiving one or more samples ($s_1 \ldots s_n$) of a plurality of monitored signals ($S_1 \ldots S_n$) carried on leads from a patient:

calculating, for each (s_m) of the one or more samples ($s_1 \ldots s_n$) of the plurality of monitored signals ($S_1 \ldots S_n$), a cross probability (p_{mk}) of observing the sample (s_m) and another sample (s_k) assuming a null hypothesis is true, wherein the null hypothesis (H_0) is that the sample (s_m) and the other sample (s_k) have a same distribution as a stored version of the sample (s_m) of the plurality of monitored signals;

weighting each of the calculated cross probabilities so that samples being closer to a norm have a larger weight;

calculating a confidence (c_{mk}) level associated with each of the cross probabilities (p_{mk});

repeating the calculating steps for all combinations of pairs of highly correlated monitored signals of the plurality of monitored signals;

summing, for each sample (s_m), all of the cross probabilities (p_{mk}) associated with a pair of correlated signals (S_{mk}) that includes the sample (s_m); and

on a user interface device, outputting a result for each sample (s_m) as a probability of not including an artifact in the sample, wherein if one or more of the probabilities of not including an artifact lies below a predetermined threshold, then indicating on the user interface that one or more samples associated with one or more of the probabilities may include an artifact.

10. (Currently Amended) The method according to claim 9, further comprising determining a range of cross probabilities of the plurality of stored monitored signals for a given clinical condition, wherein the weighting includes:

weighting each of the calculated cross probabilities (p_{mk}) as follows:

$$P_{mk} = \frac{p_{mk} - \underline{0.5}(p_{mk\,\max\,specific\ clinical\ condition} + p_{mk\,\min\,specific\ clinical\ condition})[[/\,2]]}{(p_{mk\,\max\,specific\ clinical\ condition} - p_{mk\,\min\,specific\ clinical\ condition})} \times c_{mk}$$

wherein:

$p_{mk\ max\ specific\ clinical\ condition}$ represents a maximum probability value from a stored version of a pair of monitored signals, and

$p_{mk\ min\ specific\ clinical\ condition}$ represents a minimum probability value from a stored version of a pair of monitored signals.

11. (Currently Amended) A method for detecting an artifact comprising:

receiving a plurality of monitored signals ($S_1 \ldots S_n$) from one or more leads;

extracting one or more samples (s_1 . . . s_n) of the plurality of monitored signals;

calculating, for each (s_m) of the one or more samples (s_1 . . . s_n) of the plurality of monitored signals (S_1 . . . S_n), a cross probability (p_{mk}) of observing each sample (s_m) and another sample (s_k) assuming a null hypothesis is true, wherein the null hypothesis is that a combined distribution of the sample (s_m) and the other sample (s_k) have a predetermined distribution;

calculating a confidence (c_{mk}) level associated with each of the cross probabilities (p_{mk});

repeating the calculating steps for combinations of pairs of highly correlated monitored signals of the plurality of monitored signals;

summing, for each sample (s_m), a plurality of cross probabilities (p_{mk}) associated with a plurality of pairs of highly correlated signals (S_{mk}), each of which includes a sample (s_m);

outputting for each sample a result, wherein the result is obtained by subtracting the sum from one for each sample (s_m), as a probability of including an artifact in each sample; and

on a display device, generating a display which indicates to an operator of the monitoring system, if one or more of the probabilities of including an artifact exceeds a predetermined threshold, then one or more samples associated with the one or more probabilities above the predetermined threshold may include an artifact.

12. (Currently Amended) The method according to claim 11, further comprising:

continuously performing the calculating, summing and subtracting on a periodic basis as long as signals are being received from a patient.

13. (Currently Amended) An apparatus for monitoring a patient comprising:

a plurality of leads, which ~~receive~~ carry a plurality of monitored signals from a patient, each of the monitored signals providing health information as to health of the patient;

~~a memory to store each of the received samples of the monitored signals; and~~

a processor ~~coupled to the memory, said processor being~~ programmed to:

~~employ hypothesis testing against each of a plurality of monitored signals to determine whether an artifact is present in the plurality of monitored signals, in which a null hypothesis includes an assumption that pairs of samples of correlated monitored signals of the plurality of monitored signals have a predetermined distribution; and~~

~~determine that an artifact may exist in one of the plurality of monitored signals when a likelihood that the null hypothesis is true falls below a predetermined confidence level~~

receive the plurality of signals carried on the leads from the patient,

employ hypothesis testing against each of the plurality of monitored signals to determine whether an artifact is present in the plurality of monitored signals, in which a null hypothesis includes an assumption that pairs of samples of correlated monitored signals of the plurality of monitored signals have a predetermined distribution, and the predetermined distribution including the same distribution as corresponding pairs of stored versions of the plurality of monitored signals,

determine that an artifact may exist in one of the plurality of monitored signals when a likelihood that the null hypothesis is true falls below a predetermined confidence level, and

in response to the likelihood falling below the predetermined confidence level, generate an alert; and

a user interface device connected with the processor to present the alert.

14. (Cancelled)

15. (Currently Amended) The apparatus according to ~~claim 14~~ claim 13, ~~wherein the processor is further programmed to~~ further including:

~~generate an output signal to alert an operator that at least one of the monitored signals includes an artifact when the generated probability exceeds a predetermined threshold~~ a memory connected with at least one of the leads and the processor to store samples of the monitored signals.

16. (Previously Presented) An apparatus for detecting an artifact in one or more samples ($s_1 \ldots s_n$), of a plurality of monitored signals ($S_1 \ldots S_n$), comprising:

one or more leads coupled to receive one of the one or more samples ($s_1 \ldots s_n$) of the plurality of monitored signals ($S_1 \ldots S_n$);

a memory to store each of the received one or more samples of the plurality of monitored signals; and

a processor coupled to the memory and to the one or more leads and being programmed for:

calculating, for each (s_m) of the one or more samples ($s_1 \ldots s_n$) of the plurality of monitored signals ($S_1 \ldots S_n$) a cross probability (p_{mk}) of observing each sample (s_m) and another sample (s_k) assuming a null hypothesis is true, wherein the null hypothesis (H_0) is that the sample (s_m) and the other sample (s_k) have the same distribution as a stored version of the sample (s_m) of the plurality of monitored signals;

calculating a confidence level (c_{mk}) level associated with each of the cross probabilities (p_{mk});

repeating the calculating steps for all combinations of pairs of correlated monitored signals of the plurality of monitored signals;

summing, for each sample (s_m), all of the cross probabilities (p_{mk}) associated with a pair of highly correlated signals (S_{mk}) that includes each sample (s_m); and

outputting a result for each sample (s_m)) as a probability of not including an artifact in the sample, wherein if one or more of the probabilities of not including an artifact lies below a predetermined threshold indicating to a user that one or more samples associated with one or more of the probabilities may include an artifact.

17. (Original) The apparatus according to claim 16, wherein the processor is further programmed for:

calculating a correlation matrix for the plurality of monitored signals ($S_1 \ldots S_n$) from a database of a plurality of stored monitored signals as follows:

$$\begin{bmatrix} r_{11} & \cdots & r_{1n} \\ \vdots & & \vdots \\ r_{n1} & \cdots & r_{nn} \end{bmatrix}$$

wherein r_{11} is an autocorrelation of a first monitored signal (S_1) of the plurality of monitored signals ($S_1 \ldots S_n$) with itself (r_{11}=1) and r_{1n} is a cross correlation between the first monitored signal (S_1) of the plurality of monitored signals ($S_1 \ldots S_n$) and another monitored signal (S_n) of the plurality of monitored signals ($S_1 \ldots S_n$).

18. (Original) The apparatus according to claim 17, wherein the processor is further programmed for:

identifying one or more pairs of highly correlated monitored signals among the plurality of monitored signals by determining which one or more pairs of monitored signals have a cross correlation that exceeds a predetermined threshold.

19. (Previously Presented) The apparatus according to claim 16, wherein the processor is further programmed for:

weighting each of the calculated cross probabilities so that samples being closer to a norm have a larger weight, and the weighting includes:

weighting each of the calculated cross probabilities (pmk) as follows:

$$P_{mk} = \frac{p_{mk} - \underline{0.5}(p_{mk\ \max\ specific\ clinical\ condition} + p_{mk\ \min\ specific\ clinical\ condition})[[/2]]}{(p_{mk\ \max\ specific\ clinical\ condition} - p_{mk\ \min\ specific\ clinical\ condition})} \times c_{mk}$$

wherein:

$p_{mk\ max\ specific\ clinical\ condition}$ represents a maximum probability value from a stored version of a pair of monitored signals, and

$p_{mk\ min\ specific\ clinical\ condition}$ represents a minimum probability value from a stored version of a pair of monitored signals.

20-21. (Cancelled)

22. (Previously Presented) The apparatus according to claim 13, further including:

a database which stores at least one of historical versions of the monitored signals and parameters of the historical versions of the monitored signals; and

wherein the predetermined distribution includes a distribution of one of corresponding pairs of samples of historical versions of the monitored signals and the parameters of the historical versions of the monitored signals.

23. (New) A non-transient computer readable medium carrying software which controls a processor to perform the method according to claim 3.

24. (New) A non-transient computer readable medium carrying software which controls a processor to perform the method according to claim 9.

25. (New) An apparatus for detecting an artifact in one or more samples ($s_1 \ldots s_n$) of a plurality of monitored signals ($S_1 \ldots S_n$) comprising:

one or more leads which carry the one or more samples ($s_1 \ldots s_n$) of the plurality of monitored signals from a patient;

a processor programmed to perform the method according to claim 3.

26. (New) An apparatus for monitoring a patient comprising:

a plurality of leads which carry one or more samples ($s_1 \ldots s_n$) of a plurality of monitored signals ($S_1 \ldots S_n$) from a patient;

a processor programmed to perform the method according to claim 9.